

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference (R-7695) 1339-5 PCT	FOR FURTHER ACTION	See item 4 below
International application No. PCT/US2004/028767	International filing date (<i>day/month/year</i>) 03 September 2004 (03.09.2004)	Priority date (<i>day/month/year</i>) 05 September 2003 (05.09.2003)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant RESEARCH FOUNDATION OF SUNY		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

- | | | |
|-------------------------------------|--------------|---|
| <input checked="" type="checkbox"/> | Box No. I | Basis of the report |
| <input type="checkbox"/> | Box No. II | Priority |
| <input type="checkbox"/> | Box No. III | Non-establishment of opinion with regard to novelty, inventive step and industrial applicability |
| <input type="checkbox"/> | Box No. IV | Lack of unity of invention |
| <input checked="" type="checkbox"/> | Box No. V | Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement |
| <input type="checkbox"/> | Box No. VI | Certain documents cited |
| <input type="checkbox"/> | Box No. VII | Certain defects in the international application |
| <input type="checkbox"/> | Box No. VIII | Certain observations on the international application |

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 06 March 2006 (06.03.2006)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland	Authorized officer Dorothee Mülhausen
Facsimile No. +41 22 740 14 35	Telephone No. +41 22 338 87 40

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

REC'D 17 NOV 2005

PCT WIPO PCT

To:
DAVID M. CARTER, ESQ.
CARTER, DELUCA, FARRELL & SCHMIDT, LLP
445 BROAD HOLLOW ROAD, SUITE 225
MELVILLE, NY 11747

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Applicant's or agent's file reference (R-7695) 1339-5 PCT		Date of mailing (day/month/year) 15 NOV 2005
FOR FURTHER ACTION See paragraph 2 below		
International application No. PCT/US04/28767	International filing date (day/month/year) 03 September 2004 (03.09.2004)	Priority date (day/month/year) 05 September 2003 (05.09.2003)
International Patent Classification (IPC) or both national classification and IPC IPC(7): H01B 1/24; D01F 9/12 and US Cl.: 252/502, 510, 511; 524/495, 496; 423/447.1		
Applicant RESEARCH FOUNDATION OF SUNY		

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Date of completion of this opinion 25 October 2005 (25.10.2005)	Authorized officer Stanley Silverman Jean Proctor Paralegal Specialist Telephone No. 571-272-1700
--	--	---

Form PCT/ISA/237 (cover sheet) (April 2005)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US04/28767

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:

- ☒ the international application in the language in which it was filed
☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).

2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing
☐ table(s) related to the sequence listing

b. format of material

- ☐ on paper
☐ in electronic form

c. time of filing/furnishing

- ☐ contained in the international application as filed.
☐ filed together with the international application in electronic form.
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US04/28767

Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>1-31</u>	YES
	Claims <u>NONE</u>	NO
Inventive step (IS)	Claims <u>5, 7, and 17-18</u>	YES
	Claims <u>1-4, 6, 8-16, and 19-31</u>	NO
Industrial applicability (IA)	Claims <u>1-31</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and explanations:

Claims 1-4, 6, 8-15, 19, and 21-31 lack an inventive step under PCT Article 33(3) as being obvious over Sun et al. (US 2003/0001141 A1).

Sun et al. teaches a process and composite wherein carbon nanotubes are surface modified by amines and the modified nanotubes are mixed with a polyolefin to form a composite. The amount of nanotubes in the composite, the specific amine and polyolefin, and the processing conditions are viewed to be obvious variants of the teaching of Sun et al.

Claims 1-4, 6, 8-16, and 19-31 lack an inventive step under PCT Article 33(3) as being obvious over Reynolds (US 2002/0197474 A1).

Reynolds et al. teaches a process and composite wherein carbon nanotubes are surface functionalized with amines and the modified nanotubes are mixed with a polyolefin to form a composite. The amount of nanotubes in the composite, the specific amine and polyolefin, and the processing conditions are viewed to be obvious variants of the teaching of Reynolds.

Claims 1-4, 6, 8-16, and 19-31 lack an inventive step under PCT Article 33(3) as being obvious over Haddon et al. (US 2001/0016608 A1) in view of Dupire et al. (US 6,331,265 B1).

Haddon et al. teaches a process wherein carbon nanotubes are functionalized with amines, wherein the modified nanotubes may be useful in polymer composites. Dupire teaches the need for nanotube/polyolefin composites. It would have been obvious to use the modified nanotubes of Haddon et al. in the composite of Dupire. The amount of nanotubes in the composite, the specific amine and polyolefin, and the processing conditions are viewed to be obvious variants of the teaching of Haddon et al. in view of Dupire et al.

Claims 1-31 meet the criteria set out in PCT Article 33(2), because the prior art does not teach every limitation of the claims.

Claims 5, 7, 17, and 18 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest the functionalization of nanotubes with alkenes.

Claims 1-31 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:
DAVID M. CARTER, ESQ.
CARTER, DELUCA, FARRELL & SCHMIDT, LLP
445 BROAD HOLLOW ROAD, SUITE 225
MELVILLE, NY 11747

REC'D 17 NOV 2005

PCT
WIPO PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)

Applicant's or agent's file reference (R-7695) 1339-5 PCT		Date of mailing (day/month/year) 15 NOV 2005
FOR FURTHER ACTION See paragraph 2 below		
International application No. PCT/US04/28767	International filing date (day/month/year) 03 September 2004 (03.09.2004)	Priority date (day/month/year) 05 September 2003 (05.09.2003)
International Patent Classification (IPC) or both national classification and IPC IPC(7): H01B 1/24; D01F 9/12 and US Cl.: 252/502, 510, 511; 524/495, 496; 423/447.1		
Applicant RESEARCH FOUNDATION OF SUNY		

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.
For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/ US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230	Date of completion of this opinion 25 October 2005 (25.10.2005)	Authorized officer Stanley Silverman <i>Jean Proctor</i> Paralegal Specialist Telephone No. 571-272-1700
--	--	--

Form PCT/ISA/237 (cover sheet) (April 2005)

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

PCT/US04/28767

Box No. I Basis of this opinion

1. With regard to the language, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into _____, which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1(b)).
2. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in electronic form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table(s) relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/US04/28767

Box No. V Reasoned statement under Rule 43 bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Claims <u>1-31</u>	YES
	Claims <u>NONE</u>	NO
Inventive step (IS)	Claims <u>5, 7, and 17-18</u>	YES
	Claims <u>1-4, 6, 8-16, and 19-31</u>	NO
Industrial applicability (IA)	Claims <u>1-31</u>	YES
	Claims <u>NONE</u>	NO

2. Citations and explanations:

Claims 1-4, 6, 8-15, 19, and 21-31 lack an inventive step under PCT Article 33(3) as being obvious over Sun et al. (US 2003/0001141 A1).

Sun et al. teaches a process and composite wherein carbon nanotubes are surface modified by amines and the modified nanotubes are mixed with a polyolefin to form a composite. The amount of nanotubes in the composite, the specific amine and polyolefin, and the processing conditions are viewed to be obvious variants of the teaching of Sun et al.

Claims 1-4, 6, 8-16, and 19-31 lack an inventive step under PCT Article 33(3) as being obvious over Reynolds (US 2002/0197474 A1).

Reynolds et al. teaches a process and composite wherein carbon nanotubes are surface functionalized with amines and the modified nanotubes are mixed with a polyolefin to form a composite. The amount of nanotubes in the composite, the specific amine and polyolefin, and the processing conditions are viewed to be obvious variants of the teaching of Reynolds.

Claims 1-4, 6, 8-16, and 19-31 lack an inventive step under PCT Article 33(3) as being obvious over Haddon et al. (US 2001/0016608 A1) in view of Dupire et al. (US 6,331,265 B1).

Haddon et al. teaches a process wherein carbon nanotubes are functionalized with amines, wherein the modified nanotubes may be useful in polymer composites. Dupire teaches the need for nanotube/polyolefin composites. It would have been obvious to use the modified nanotubes of Haddon et al. in the composite of Dupire. The amount of nanotubes in the composite, the specific amine and polyolefin, and the processing conditions are viewed to be obvious variants of the teaching of Haddon et al. in view of Dupire et al.

Claims 1-31 meet the criteria set out in PCT Article 33(2), because the prior art does not teach every limitation of the claims.

Claims 5, 7, 17, and 18 meet the criteria set out in PCT Article 33(2)-(3), because the prior art does not teach or fairly suggest the functionalization of nanotubes with alkenes.

Claims 1-31 meet the criteria set out in PCT Article 33(4), and thus have industrial applicability because the subject matter claimed can be made or used in industry.